

Application No.: 10/671,289  
Amendment and Response dated August 27, 2007  
Reply to Final Office Action of May 30, 2007  
Docket No.: 903-86 RCE  
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**Remarks:**

Claims 1-4, 6-8 and 10-13 are pending in this application. The Applicant appreciates that Applicant's arguments filed on May 16, 2007 have been fully considered and have been deemed persuasive. On the other hand, the Examiner has rejected the current claims under 35 U.S.C. 103(a) as being unpatentable over Breton et al. (U.S. Patent No. 5,211,747), in view of Breton et al. (U.S. Patent No. 5,254,158) and Taguchi (U.S. Patent No. 7,052,534).

Applicants respectfully traverse this rejection.

Breton '747, mentions both piezo-DOD and thermo-DOD as a system in which the ink compositions may be used. However, Breton '747 does not provide ink compositions specifically optimized for piezo-DOD, specifically distinguishing those systems that use a piezoelectric transducer:

The ink compositions of the invention preferably can be used in ink jet printing systems. Such inks are preferably capable of being utilized without clogging or leading in either the type of printing system which uses thermal energy to produce a vapor bubble in an ink-filled channel to expel a drop of ink, or the type of system which uses a piezoelectric transducer to produce a pressure pulse that expels droplets from a nozzle.  
(Col. 6, lines 61-68).

Thus, it is clear that Breton '747 is not directed to ink compositions for piezo-DOD systems.

The Examiner further asserts that Breton '747 discloses humectants. This assertion, however, is only partly correct. Indeed, Breton does mention humectants; however, the definition of "humectant" as used by Breton covers each and every non-water components of the liquid vehicle that has a boiling point higher than that of water. Breton's use of "humectant" is clear from the following passages:

Other optional additives to inks include biocides such as Dowicil 150, 200, and 75, benzoate salts, sorbate salts, and the like, present in an amount of from about 0.0001 to about 4 percent by weight, and preferably from about 0.01 to about 2.0 percent by weight, **humectants** and penetration control additives such as ethylene glycol, diethyleneglycol, N-methylpyrrolidinone, propylene glycol, hydroxyethers, ethers, amides, sulfoxides, ketones, lactones, esters, alcohols, butyl carbitol, benzyl alcohol, isopropanol, cyclohexylpyrrolidone, 1,2-hexanediol, and the like, present in an amount of from 0 to about 50 percent by weight, and preferably from about 5 to about 40 percent by weight; pH controlling agents such as acids or bases, phosphate salts, carboxylate salts, sulfite salts, amine salts and the like, present in an amount of from 0 to about 1 percent by weight and preferably from about 0.01 to about 1 percent by weight, or the like. Surface active agents such as the polyalkylenelmine/alkylene oxide block copolymers and the primary or secondary polyoxyalkylene amines disclosed in simultaneously filed U.S. Application No. 07/701,242 may also be added.

(Col. 6, lines 28-49) (emphasis added).

When mixtures of water and water miscible organic liquids are selected as the liquid vehicle, the water to organic ratio may be in any effective range, and typically is from about 100:0 to about 30:70, preferably from about 97:3 to about 50:50. The non-water component of the liquid vehicle generally serves as a **humectant** which has a boiling point higher than that of water (100 DEGC.). Heterophase ink jet inks are also known.

(Col. 5, lines 59-66) (emphasis added).

#### COMPARATIVE EXAMPLES 1 AND 2

An ink formulation is prepared containing 3 wt. % Food Black #2, **10 wt. % propylene carbonate**, and 87% deionized water. In Example 1, the ink is applied to diazo paper. In Example 2, the ink is applied to Xerox 4024.RTM. paper and Sanyo L.RTM. paper.

#### EXAMPLES 3-12

Ink compositions are prepared containing the formulation as set forth in Example 2, except that 1 wt. % of the deionized water is replaced with wt. % of a desizing agent.

#### EXAMPLE 13

An ink composition is prepared containing 3 wt. % Food Black #2, **5.25 wt. % diethylene glycol**, 4 wt. % Discole.RTM. N-518 (a surface active agent

available from DKS International, Inc.), wt. % of a desizing agent, and 86.75 wt. % water.

COMPARATIVE EXAMPLE 14

An ink composition is prepared as in Example 3, except that no desizing agent is added.  
(Col. 7, lines 7-53) (emphasis added).

The Examiner further asserts that Breton '747 discloses lower alcohols. Again, this assumption is only partially correct. Breton does not mention or use the term "lower alcohols". Although certain alcohols are listed, they are merely given as examples of useful humectants and penetration control agents. Notably, isopropanol is mentioned in these lists. However, isopropanol is mentioned as a humectant. Interestingly, Breton also teaches that a humectant should have a boiling temperature greater than that of water. Thus, the person skilled in the art would have no reason or motivation to use isopropanol (which has a boiling point of 82°C), and most definitely not in combination with (other) humectants.

It is further notable that no lower alcohols have been used in the inks of Breton's examples.

The Examiner further asserts that Breton '747 discloses a lower alcohol content of 5-30% by weight. This assumption is incorrect.

Breton, at column 5, lines 44-58, mentions various water miscible organic solvents, including alcohols. However, lower alcohols are not mentioned. Moreover, the solvents are mentioned in an amount of 100:0 to 30:70 *vis-à-vis* water. In contrast, at column 6, lines 28-40, Breton discloses the use of humecants and penetration control additives in an amount of from about 5 to about 40 percent by weight. This is clearly a different range, and not a range specific for the lower alcohol content. There can be but one conclusion: Breton '747 does not disclose the use of a lower alcohol content of 5-30% by weight.

The Examiner's assertion that Breton discloses a humectant to lower alcohol weight ratio of between 0.1 and 1.5 is pertinently wrong. The ranges mentioned by the Examiner (Page 2) can not be found in the Breton '747 specification. In fact, Breton is silent about this ratio and indeed does not appear to have made any distinction between humectants and lower alcohols.

The Applicant, therefore, finds itself in a position that the closest prior art which is used as a starting point of the detailed action is not as relevant as the Examiner has asserted. The differences between the disclosure of Breton and the patent in suit are substantial, and not obvious to a person having ordinary skill in the art to which the claimed subject matter pertains.

Claim 1 is clearly not obvious over Breton '747. Likewise, dependent claims 2-7, 10 and 12 are also not obvious over Breton '747. Further, the ink composition of claim 8 and dependent claims 11 and 13 are likewise not obvious over '747. Again, the limitation present in the claims as currently pending that the humectant to lower alcohol weight ratio is between 0.10 and 1.50 is not disclosed, either explicitly or implicitly, nor has it even been suggested.

Similarly, the second reference cited and relied upon by the Examiner, Breton '158, is silent as to any humectant to lower alcohol weight ratio, let alone to a specific ratio as is presently claimed.

Even further, Breton '158 is clearly not related to piezo-DOD ink compositions. Breton '158 explicitly states that such compositions would only have disadvantages:

Since drop-on-demand systems require no ink recovery, charging, or deflection, the system is much simpler than the continuous stream type. There are two type of drop-on-demand ink jet systems. One type of drop-on-demand system has its major components an ink filled channel or passageway having a nozzle on one end and a piezoelectric transducer near the other end to produce

pressure pulses. The relatively large size of the transducer prevents close spacing of the nozzles, and physical limitations of the transducer result in low ink drop velocity. Low drop velocity seriously diminishes tolerances for drop velocity variation and directionality, thus impacting the system's ability to produce high quality copies. Drop-on-demand systems which use piezoelectric devices to expel the droplets also suffer the disadvantage of a slow printing speed.  
(Col. 1, lines 35-50).

A person of ordinary skill in the art to which the currently claimed subject-matter pertains would clearly have had no reason whatsoever to combine Breton '747 with Breton '158 in order to prepare a piezo-DOD ink composition. Even assuming that a skilled person would have combined these two references, then it could only have been to prepare *thermo-DOD* ink compositions.

Taguchi (U.S. Patent No. 7,052,534) has been discussed extensively in the previous response. Both the applicant and the Examiner have agreed that Taguchi does not describe the ratio as presently claimed between the humectant and the lower alcohol. Even assuming that the skilled person would have been motivated to combine Breton '747 and Breton '158 with Taguchi, the skilled person would still not obtain an ink composition, which would be suitable for piezo-DOD systems and which would have a lower alcohol and humectant in the specifically claimed range. Thus, it is deemed that the claims of the application as pending are patentable over the cited references.

The Examiner is respectfully requested to reconsider his objections and to proceed with the grant of a patent.

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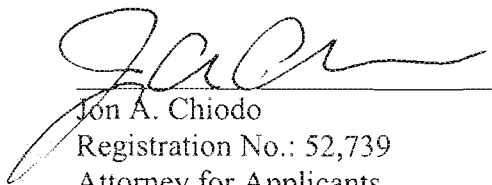
**Summary**

Applicants respectfully submit that independent claims 1 and 8, and all claims dependent therefrom, are patentably distinct from the prior art. This application is believed to be in condition for allowance. Favorable action thereon is therefore respectfully solicited.

Should the Examiner have any questions or comments concerning the above, the Examiner is respectfully invited to contact the undersigned attorney at the telephone number given below.

The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 08-2461. Such authorization includes authorization to charge fees for extensions of time, if any, under 37 C.F.R. § 1.17 and also should be treated as a constructive petition for an extension of time in this reply or any future reply pursuant to 37 C.F.R. § 1.136.

Respectfully submitted,

  
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